## What is claimed is:

- 1. A method of screening for an agent that modulates the interaction of a first test protein linked to a DNA binding moiety and a second test protein linked to a transcriptional activation moiety, comprising co-encapsulating the agent with the first test protein and second test protein in a suitable microenvironment and determining the ability of the agent to modulate the interaction of the first test protein linked to a DNA binding moiety with the second test protein covalently linked to a transcriptional activation moiety, wherein the agent enhances or inhibits the expression of a detectable protein, and wherein the enhancement or inhibition is detected by FACS analysis.
- The method of claim 1, wherein the agent is an enzyme or small molecule.
- 3. The method of claim 2, wherein the enzyme is selected from the group consisting of lipases, esterases, proteases, glycosidases, glycosyl transferases, phosphatases, kinases, mono- and dioxygenases, haloperoxidases, lignin peroxidases, diarylpropane peroxidases, epozide hydrolases, nitrile hydratases, nitrilases, transaminases, amidases, and acylases.
- The method of claim 1, wherein the agent inhibits the activity of the first protein or the second protein.
- The method of claim 1, wherein the agent enhances the activity of the first protein or the second protein.
- The method of claim 1, wherein the agent is expressed from a recombinant cell co-encapsulated with the recombinant cell expressing the target protein and detectable marker.
- The method of claim 6, wherein the recombinant cell is a eukaryotic cell.

- 8. The method of claim 6, wherein the recombinant cell is a prokaryotic cell.
- The method of claim 1, wherein the micro-environment is a liposome, gel microdrop, bead, agarose, cell, ghost red blood cell or ghost macrophage.
- 10. The method of claim 9, wherein the liposomes are prepared from one or more phospholipids, glycolipids, steroids, alkyl phosphates or fatty acid esters.
- 11. The method of claim 10, wherein the phospholipids are selected from the group consisting of lecithin, sphingomyelin and dipalmitoyl.
- The method of claim 10, wherein the steroids are selected from the group consisting of cholesterol, chlorestanol and lanosterol.
- 13. The method of claim 1, wherein the detectable marker is a fluorescent dye, a visible dye, a bioluminescent material, a chemiluminescent material, a radioactive material, or an enzymatic substrate.
- The method of claim 13, wherein the bioluminescent material is green fluorescent protein (GFP) or red fluorescent protein (RFP).
- 15. The method of claim 13, wherein detection of the fluorescent dye or a visible dye is carried out by fluorometric or spectrophotometric measurement.